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DATE: Tuesday, March 09, 2004

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☐	L5	L3 and phospholipid$	0
☐	L4	L3 and lecithin	0
☐	L3	rumina$ and (megalac or superlac or lipicafat)	13
☐	L2	L1 and lecithin	35
☐	L1	rumina$ and (megalac or superlac or lipicafat or advance)	404

END OF SEARCH HISTORY

L3: Entry 11 of 13 File: USPT Sep 23, 1997

DOCUMENT-IDENTIFIER: US 5670191 A
TITLE: Aliphatic amide feed supplement for ruminants

Abstract Text (1):
A feedstock and a method of utility are provided for increasing the content of unsaturated fatty acids in the tissues and milk of ruminants. A preferred feedstock is composed of a fodder substrate which is blended with an unsaturated aliphatic amide ingredient such as soyamide. The unsaturated aliphatic amide is biohydrogenation-resistant, and bypasses the rumen substantially intact. The aliphatic amide is converted to free fatty acid in the digestive tract, and subsequently is absorbed in the tissues and milk of the ruminant.

Brief Summary Text (5):
There has been a continuing need for new dietary supplements for animal feedstuff which can be fed to ruminant animals without interfering with feed metabolism by rumen microorganisms, and which have a high level of digestibility.

Brief Summary Text (6):
U.S. Pat. Nos. 4,642,317; 4,826,694; 4,853,233; and 4,909,138 describe the incorporation of insoluble fatty acid salts in ruminant feed as a means of increasing the fat content of the feed without deleteriously affecting the ruminant digestion cycle. A feed additive such as fatty acid calcium salt functions as a rumen bypass product, and is subsequently metabolized in the abomasum or small intestine of the ruminant.

Brief Summary Text (9):
Ruminants such as cattle are the main source of red meat and dairy products for human consumption. It has been determined that unsaturated fatty acids are susceptible to biohydrogenation by microorganisms in the rumen of ruminants. The higher content of saturated fatty acids is absorbed in the digestive tract and there is an increase in the amount of saturated fatty acids in the tissues and milk of the ruminants.

Brief Summary Text (10):
Recent investigations have been directed to methods for inhibiting biohydrogenation of unsaturated fatty acids in the rumen. It has been postulated that ruminal bacteria biohydrogenate unsaturated fatty acids which have a free carboxylic acid group. Based on this premise, attention has been directed to unsaturated fatty acid analogs which did not have a free carboxylic acid group.

Brief Summary Text (11):
An in vitro procedure has been conducted to determine the ability of N-linoleic acid amide methionine ester to resist hydrolysis and biohydrogenation by ruminal microorganisms. It was found that the linoleic acid amide derivative exhibited resistance to hydrolysis and biohydrogenation by the ruminal bacteria. The study is reported in the Journal of Dairy Science, 75 1527 (1992).

Brief Summary Text (12):
Another important factor in the preparation of ruminant feedstocks with a content of fatty acid supplement is the level of digestibility of the fatty acid

ingredient. Fatty acids and fatty acid salts and analogs differ in the proportion of fatty acid which is digested and absorbed, relative to the unabsorbed fatty acid which passes out of the digestive tract as solid waste.

Brief Summary Text (13):
There is continuing interest in the development of new methods and feedstocks for increasing the content of unsaturated fatty acids in the tissues and milk of ruminants.

Brief Summary Text (14):
Accordingly, it is an object of this invention to provide a method for producing meat and dairy products from ruminants that are healthier for human consumption.

Brief Summary Text (15):
It is another object of the invention to provide a process for the production of a ruminant feed supplement which can function as a rumen bypass composition, and permit a beneficial increase in the dietary fat content of the feed.

Brief Summary Text (16):
It is another object of this invention to provide a feed supplement comprising unsaturated fatty acids that are protected from biohydrogenation in the rumen of ruminants.

Brief Summary Text (17):
It is another object of this invention to provide a feed supplement for ruminants that will increase the amount of unsaturated fatty acids absorbed into the blood stream of the animal.

Brief Summary Text (18):
It is another object of this invention to provide a feed supplement for ruminants which comprises an unsaturated fatty acid analog which is absorbed with minimal loss as undigested feed.

Detailed Description Text (2):
One or more objects of the present invention are accomplished by the provision of a method for increasing the amount of unsaturated fatty acids in the tissues and milk of ruminants which comprises feeding a ruminant with a feedstock containing an unsaturated aliphatic amide supplement ingredient which is resistant to biohydrogenation in the rumen, wherein the aliphatic amide corresponds to the formula: ##STR1## where R is an unsaturated C.sub.11 -C.sub.21 aliphatic substituent.

Detailed Description Text (14):
A present invention aliphatic amide feed supplement can be admixed with a conventional fodder for facilitating ingestion by ruminants. The aliphatic amide feed supplement is incorporated in a fodder in an amount which is effective for increasing absorption and deposition of unsaturated fatty acids in the tissues and milk of a ruminant. Typically the aliphatic amide content in a base feed for ruminants will be in the range between about 0.5-20 weight percent, preferably between about 3-8 weight percent. A base feed normally is selected from corn, hay, grass, barley, oats, sorghum, wheat, bran, hominy, and mixtures thereof.

Detailed Description Text (15):
An aliphatic amide supplement can comprise a mixture of unsaturated and saturated fatty acid amides. When an aliphatic amide ruminant feed supplement is a mixture of fatty acid amides, preferably the supplement contains at least about 40 weight percent of oleic acid amide or linoleic acid amide or a mixture thereof, and most preferably contains at least about 70 weight percent of this type of unsaturated fatty acid amide.

Detailed Description Text (31):
Ruminants are a class of even-toed hoofed mammals that chew the cud and have a complex three or four chambered stomach, such as cattle, sheep, goats and deer. Because of the multiple stomach functionality, the digestive system of ruminants differs substantially from that of monogastric animals.

Detailed Description Text (32):
The first and largest stomach located after the esophagus in ruminants is referred to as the rumen. Unique to ruminants, the rumen contains microorganisms, such as bacteria and protozoa, which break down complex compounds ingested by the animal by a process known as ruminal fermentation. Among the substances and compounds transformed by these microorganisms are unsaturated fatty acids. When a ruminant ingests an unsaturated fatty acid such as oleic acid, at least a portion of the unsaturated fatty acid is converted to a saturated fatty acid which is absorbed in the tissues and milk of the animal.

Detailed Description Text (33):
An essential aspect of the present invention is the feeding of ruminants with a feed containing an unsaturated aliphatic amide feed supplement which exhibits rumen-bypass properties, and which is capable of resisting ruminal degradation. A present invention unsaturated aliphatic amide bypasses the rumen substantially intact, and is absorbed as free fatty acid from the digestive tract, and subsequently is transferred into the tissues and milk of ruminants.

Detailed Description Text (34):
The unsaturated aliphatic amide feed supplement in accordance with the present invention does not cause harmful side effects in a ruminant. Normally, when free fatty acids are increased in the diet of a ruminant, the fatty acids have an inhibitory effect on bacterial fermentation within the rumen. However, a present invention unsaturated aliphatic amide does not demonstrate a similar effect.

Detailed Description Text (35):
A present invention unsaturated aliphatic amide ruminant feed supplement is a convenient and economical means for increasing the amount of unsaturated fatty acids absorbed and deposited in the tissues and milk of ruminants such as Holstein and Jersey dairy cattle. It is a unique aspect of the present invention that the unsaturated aliphatic amide does not have toxic effects on the microorganisms in the rumen.

Detailed Description Text (37):
A present invention unsaturated aliphatic amide, which is a N-unsubstituted compound, has significant advantages as a ruminant feed supplement, in comparison to an unsaturated aliphatic amide compound which is N-monosubstituted or N-disubstituted as illustrated by the following structure: ##STR2## where at least one of R.sup.1 or R.sup.2 is an organic substituent such as an alkyl radical.

Detailed Description Text (38):
An unsaturated and N-unsubstituted aliphatic amide feed supplement in accordance with the present invention is palatable and has good acceptance by feeding ruminant. A present invention aliphatic amide exhibits a high level of biohydrogenation-resistance in the rumen, and does not interfere with ruminal fermentation.

Detailed Description Text (39):
Further, a present invention N-unsubstituted aliphatic amide is more readily absorbed in the digestive tract of a ruminant than a corresponding N-substituted aliphatic amide, as there is less loss as undigested solid waste matter.

Detailed Description Text (42):
This Example illustrates the beneficial effects derived by feeding an unsaturated

aliphatic amide feed supplement to ruminants in accordance with the present invention.

Detailed Description Text (43):
The relative ruminal biohydrogenation-resistance and digestibility of a present invention soyamide in comparison to soybean oil and butylsoyamide are demonstrated in accordance with the procedures described in J. Anim. Sci., 73, 818 (1995) by T. C. Jenkins.

Detailed Description Text (46):
Blood and ruminal samples, and digestibility measurements and amide analyses, are managed with the methods described in the J. Anim., Sci., 73, 818 (1995) publication.

Detailed Description Text (47):
Relative to the control diet, soybean oil increases plasma linoleic acid concentration 22%, the butylsoyamide increases linoleic acid by 58%, and the soyamide increases linoleic acid by 61%. The increase in plasma unsaturated fatty acids demonstrates at least partial resistance of the fatty acid amides to ruminal biohydrogenation, and their digestion and absorption postruminally.

Detailed Description Text (52):
The comparative data indicate that soyamide and butylsoyamide are more resistant to ruminal biohydrogenation than soybean oil, and soyamide is more resistant to ruminal biohydrogenation than butylsoyamide.

Detailed Description Text (57):
The fatty acid feed supplement is in the form of a calcium salt of palm fatty acid distillate (Megalac, Church & Dwight Co.), or soyamide.

Detailed Description Text (58):
Table 1 illustrates the composition of the basal concentrate mix. Table 2 lists the nominal unsaturated fatty acid content of Megalac and soyamide, respectively. Table 3 illustrates the effect of the fatty acid feed supplement type on the unsaturated fatty acid content of the dairy milk.

Detailed Description Paragraph Table (5):
TABLE 2 Fatty Acid Content Of Feed

Supplement	Weight %	Feed Supplement	Oleic Acid	Linoleic Acid
Megalac	Ca salt	34	8	
Soyamide		25	52	

Detailed Description Paragraph Table (6):
TABLE 3 Feed Supplement Effect On Milk Fat Composition

Feed Supplement	Oleic Acid	Linoleic Acid
Megalac Ca salt	26	3
Soyamide	39	28

CLAIMS:

1. A method for increasing the amount of unsaturated fatty acids in the tissues and milk of ruminants which comprises feeding a ruminant with a feedstock containing an unsaturated aliphatic amide supplement ingredient which is resistant to biohydrogenation in the rumen, wherein the aliphatic amide corresponds to the formula: ##STR3## where R is an unsaturated C.sub.11 -C.sub.21 aliphatic substituent.

2. A method in accordance with claim 1 wherein the ruminants are cattle or sheep.

6. A feedstock for ruminants for increasing the unsaturated fatty acid content in

the tissues and milk of the ruminants, which comprises a fodder substrate containing between about 2-20 weight percent of an aliphatic amide supplement which comprises an ingredient corresponding to the formula: ##STR4## where R is an unsaturated C.sub.11 -C.sub.21 aliphatic substituent.

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☐ 1. Document ID: US 6596768 B2

Using default format because multiple data bases are involved.

L3: Entry 1 of 13 File: USPT Jul 22, 2003

US-PAT-NO: 6596768
DOCUMENT-IDENTIFIER: US 6596768 B2

TITLE: Unsaturated lipid-enriched feedstock for ruminants

DATE-ISSUED: July 22, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Block; Elliot	Yardley	PA		
Sanchez; William K.	Tigard	OR		
Cummings; Kenneth R.	Skillman	NJ		

US-CL-CURRENT: 514/560; 514/460

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWMC | Draw De

☐ 2. Document ID: US 6521249 B2

L3: Entry 2 of 13 File: USPT Feb 18, 2003

US-PAT-NO: 6521249
DOCUMENT-IDENTIFIER: US 6521249 B2

TITLE: Feedstock for prepartum dairy cattle

DATE-ISSUED: February 18, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Block; Elliot	Yardley	PA		
Sanchez; William K.	Tigard	OR		
Cummings; Kenneth R.	Skillman	NJ		

US-CL-CURRENT: 424/442; 424/400, 424/438, 424/439, 424/489, 426/72, 426/74, 426/807

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw De

☐ 3. Document ID: US 6440447 B1

L3: Entry 3 of 13 File: USPT Aug 27, 2002

US-PAT-NO: 6440447
DOCUMENT-IDENTIFIER: US 6440447 B1

TITLE: Method and composition for enhancing milk production

DATE-ISSUED: August 27, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Luhman; Cindie M.	Jewell	IA		

US-CL-CURRENT: 424/438; 424/442, 426/2, 426/53, 426/635, 426/639, 426/807, 514/738

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw De

☐ 4. Document ID: US 6403143 B1

L3: Entry 4 of 13 File: USPT Jun 11, 2002

US-PAT-NO: 6403143
DOCUMENT-IDENTIFIER: US 6403143 B1

TITLE: Flowable dry nutritive mixture and process for its manufacture

DATE-ISSUED: June 11, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bevans; Basil D.	Quincy	IL		
Bunting; L. Dwain	Quincy	IL		
Hickman; Dan S.	Payson	IL		

US-CL-CURRENT: 426/634; 426/630, 426/656, 426/807

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw De

☐ 5. Document ID: US 6319525 B1

L3: Entry 5 of 13 File: USPT Nov 20, 2001

US-PAT-NO: 6319525
DOCUMENT-IDENTIFIER: US 6319525 B1

TITLE: Process for optimizing milk production

DATE-ISSUED: November 20, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Knight; Christopher D.	St. Louis	MO		
Koenig; Karen M.	Lethbridge			CA
Rode; Lyle M.	Lethbridge			CA
Vandenberg; Michael J.	St. Louis	MO		
Vazquez-Anon; Mercedes	Chesterfield	MO		

US-CL-CURRENT: 426/2; 424/438, 426/231, 426/635, 426/807

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWMC | Draw De

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☐ 6. Document ID: US 6299913 B1

L3: Entry 6 of 13 File: USPT Oct 9, 2001

US-PAT-NO: 6299913
DOCUMENT-IDENTIFIER: US 6299913 B1
**** See image for Certificate of Correction ****

TITLE: Macromineral dietary factors in ruminant nutrition

DATE-ISSUED: October 9, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Block; Elliot	Yardley	PA		
Sanchez; William K.	Tigard	OR		
Zuccarella; William	Cream Ridge	NJ		
Cummings; Kenneth R.	Skillman	NJ		

US-CL-CURRENT: 426/2; 426/74, 426/807

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWMC | Draw De

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☐ 7. Document ID: US 6242013 B1

L3: Entry 7 of 13 File: USPT Jun 5, 2001

US-PAT-NO: 6242013
DOCUMENT-IDENTIFIER: US 6242013 B1
**** See image for Certificate of Correction ****

TITLE: Method and composition for enhancing oleic acid content of milk produced by ruminants

DATE-ISSUED: June 5, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Luhman; Cindie M.	Jewell	IA		
Feng; Ping	West Des Moines	IA		
Kerr; Phil	Wildwood	MO		

US-CL-CURRENT: 426/2; 426/580, 426/601, 426/623, 426/630, 426/807

Full | Title | Citation | Front | Review | Classification | Date | Reference | [illegible] | Claims | KWMC | Draw De

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☐ 8. Document ID: US 6183786 B1

L3: Entry 8 of 13 File: USPT Feb 6, 2001

US-PAT-NO: 6183786
DOCUMENT-IDENTIFIER: US 6183786 B1

TITLE: Process for optimizing milk production

DATE-ISSUED: February 6, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Knight; Christopher D.	St. Louis	MO		
Koenig; Karen M.	Lethbridge			CA
Rode; Lyle M.	Lethbridge			CA
Vandenberg; Michael J.	St. Louis	MO		
Vazquez-Anon; Mercedes	Chesterfield	MO		

US-CL-CURRENT: 426/2; 426/231, 426/438, 426/623, 426/630, 426/636, 426/807

Full | Title | Citation | Front | Review | Classification | Date | Reference | [illegible] | Claims | KWMC | Draw De

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☐ 9. Document ID: US 6017563 A

L3: Entry 9 of 13 File: USPT Jan 25, 2000

US-PAT-NO: 6017563
DOCUMENT-IDENTIFIER: US 6017563 A

TITLE: Process for optimizing milk production

DATE-ISSUED: January 25, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Knight; Christopher D.	St. Louis	MO		

Koenig; Karen M.	Lethbridge		CA
Rode; Lyle M.	Lethbridge		CA
Vandenberg; Michael J.	St. Louis	MO	
Vazquez-Anon; Mercedes	Chesterfield	MO	

US-CL-CURRENT: 426/2; 424/438, 426/231, 426/635, 426/807

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWMC | Draw. De

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☐ 10. Document ID: US 5714185 A

L3: Entry 10 of 13 File: USPT Feb 3, 1998

US-PAT-NO: 5714185
DOCUMENT-IDENTIFIER: US 5714185 A
**** See image for Certificate of Correction ****

TITLE: Protected feed product

DATE-ISSUED: February 3, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Mahadevan; Subramaniam	Nepean			CA

US-CL-CURRENT: 426/93; 424/438, 426/630, 426/635, 426/807

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWMC | Draw. De

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☐ 11. Document ID: US 5670191 A

L3: Entry 11 of 13 File: USPT Sep 23, 1997

US-PAT-NO: 5670191
DOCUMENT-IDENTIFIER: US 5670191 A

TITLE: Aliphatic amide feed supplement for ruminants

DATE-ISSUED: September 23, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Cummings; Kenneth R.	Skillman	NJ		
Forrest; Ronald L.	Cranbury	NJ		

US-CL-CURRENT: 426/2; 426/601, 426/630, 426/635, 426/636, 426/807, 514/558, 514/560, 554/35

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWMC | Draw. De

☐ 12. Document ID: US 5662958 A

L3: Entry 12 of 13 File: USPT Sep 2, 1997

US-PAT-NO: 5662958
DOCUMENT-IDENTIFIER: US 5662958 A

TITLE: Method for modifying canola seeds for use in ruminant feed

DATE-ISSUED: September 2, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kennelly; John Joseph	Edmonton			CA
Nielsen; Debra Diane	Newark	DE		
Lewis; William Isaac	Kingston			CA
Rowland; Mary Ellen	Highland	IL		

US-CL-CURRENT: 426/630; 426/309, 426/460, 426/507, 426/635

Full | Title | Citation | Front | Review | Classification | Date | Reference | ... | Claims | KWMC | Draw De

☐ 13. Document ID: US 5004728 A

L3: Entry 13 of 13 File: USPT Apr 2, 1991

US-PAT-NO: 5004728
DOCUMENT-IDENTIFIER: US 5004728 A

TITLE: Methods of increasing milk yields in ruminants

DATE-ISSUED: April 2, 1991

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Chalupa; William	Malvern	PA		
Kronfeld; David S.	Coatesville	PA		
Schneider; Paul L.	Milwaukee	WI		
Sklan; David	Rehovot			IL

US-CL-CURRENT: 514/12; 514/558, 514/560

Full | Title | Citation | Front | Review | Classification | Date | Reference | ... | Claims | KWMC | Draw De

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Terms	Documents

rumina$ and (megalac or superlac or lipicafat)	13

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L3: Entry 13 of 13 File: USPT Apr 2, 1991

DOCUMENT-IDENTIFIER: US 5004728 A
TITLE: Methods of increasing milk yields in ruminants

Abstract Text (1):
Novel methods for increasing milk yields in lactating ruminants are disclosed wherein somatotropin and salts of long chain fatty acids are administered generally coextensive in time to the animals in amounts sufficient to increase the production of milk.

Brief Summary Text (10):
Due to adverse effects of fat on ruminal fermentation, supplementation of unprotected fat has been limited to about 2% of the diet. In order to reduce these adverse effects and increase the amount of supplementary long chain fatty acids which could be fed to cows, studies with various salts of long chain fatty acids have been conducted. In vitro studies with calcium salts of palm oil indicated that they are inert in the rumen, do not interfere with ruminal fermentation and increase milk yield and milk fat. These salts can thus be fed at higher amounts. Palm oil is largely made up of LCFA (56% - 16:0, 4% - 18:0, 33% - 18:1 and 6.0% - 18:2). U.S. Pat. No. 4,642,317, issued 2/10/87 to Palmquist discloses a method of feeding lactating cows calcium salts of long chain fatty acids from natural sources, particularly tallow because of its low cost. This method allowed supplementation of the diet of lactating cows with calcium salts of long chain fatty acids in the amount of 5% of the dry weight of feed per day or one kilogram of calcium salts of long chain fatty acids per animal per day without ill effects.

Brief Summary Text (11):
There is a need for new methods of increasing milk yields in ruminant animals, especially cows whereby milk production can be increased without adversely affecting the health of the animal. Accordingly, it is an object of this invention to provide methods of increasing the production of milk in lactating ruminants.

Brief Summary Text (13):
The invention provides methods of improving the production of milk from a lactating ruminant animal. Somatotropin is administered to the animal and generally coextensive in time, the food supply if the animal is supplemented with a long chain fatty acid or long chain fatty acid derivative selected to be substantially inert with respect to the rumination of the animal. Administration of somatotropin and supplementation of the food supply each are in amounts sufficient to effect the improvement in milk production.

Brief Summary Text (14):
The invention further provides methods for improving conversion of dietary foodstuffs into milk in a lactating ruminant animal. Somatotropin is administered to the animal in preferred amounts of from about 5 to about 75 milligrams per day; and a dietary supplement is coadministered to the animal. The dietary supplement preferably comprises a nutritionally acceptable divalent metal salt of a long chain fatty acid, the salt being selected not to interfere with the rumination of the animal and being provided in an amount sufficient to effect the improvement upon

the conversion of dietary foodstuffs into milk.

Brief Summary Text (17):
Somatotropin from any species of animal which produces increased milk yields in lactating ruminants is suitable for use in the invention. Natural somatotropin or somatotropin produced by recombinant DNA techniques are suitable for use in the invention. Natural bovine somatotropin and bovine somatotropin produced by recombinant DNA techniques are preferred for use in the invention.

Brief Summary Text (20):
The long chain fatty acid derivative is preferably a long chain fatty acid salt. The salt of the long chain fatty acid can be any salt which does not interfere with the rumination of the animal. The salt of the long chain fatty acid should be substantially inert in the rumen of the animal. Alkaline earth salts which are insoluble in the rumen are most suitable for use in the invention. Calcium salts of long chain fatty acids are preferred.

Brief Summary Text (21):
Free long chain fatty acids may be fed to the lactating ruminant in amounts up to 2% of the animal's diet. However, salt of the long chain fatty acid may be fed to the lactating ruminant in accordance with the invention in amounts from about 0.3 kilograms per day to about 1.0 kilograms per day. Preferred quantities of the salt of long chain fatty acids are about 0.45 kilograms per day to about 0.77 kilograms per day.

Detailed Description Text (2):
Sixteen cows were randomly assigned to either a 0 or 50 milligrams per day somatotropin group four weeks postpartum. Within each group cows received either 0 or 0.77 kilograms per day calcium salts of long chain fatty acids (Megalac, Church and Dwight Co., Inc.) in a single reversal with 5 week periods. Cows receiving 50 milligrams per day bovine somatotropin (American Cyanamid) produced more milk and 4% fat-corrected milk (FCM), had higher gross efficiency and greater energy output into milk. There was no response to calcium salts of long chain fatty acids when no bovine somatotropin was administered. Response to calcium salts of long chain fatty acids with 50 milligrams per day of somatotropin was greater than with 50 milligrams per day bovine somatotropin alone. Ruminally inert calcium salts of long chain fatty acids tended to help cows receiving somatotropin in early lactation achieve increased production potential.

Detailed Description Text (4):
Cows in early lactation were supplemented with 0 or 1 pound (0.45 kg) calcium salts of palm oil (Megalac, Church and Dwight Co., Inc.) and supplemented daily with 0 or 50 milligrams per day bovine somatotropin (American Cyanamid). In the absence of supplemental fat, bovine somatotropin increased production of 3.5% FCM 6.8 pounds per day over controls receiving no bovine somatotropin. With supplemental fat, bovine somatotropin increased production of 3.5% FCM 14.3 pounds per day. Thus, rumen bypass fat was needed to maximize responses to supplemental bovine somatotropin.

Detailed Description Text (6):
Cows in early lactation were supplemented with 0 or 0.45 kilograms per day calcium salts of palm oil fatty acids (Megalac, Church and Dwight Co., Inc.) and injected daily with 0 or 50 mg bovine somatotropin (American Cyanamid). In the absence of supplemental fat, injection of bovine somatotropin increased production of 3.5% FCM 3.9 kilograms per day. With supplemental fat, injection of bovine somatotropin increased production of 3.5% FCM 7.3 kilograms per day. Supplemental fat did not increase production of milk in the absence of bovine somatotropin but when cows were injected with bovine somatotropin, fat supplementation increased 3.5% FMC 3.1 kilograms per day.

Other Reference Publication (2):
Schneider, et al., "Bovine Somatotropin and Ruminally Inert Fat in Early Lactation", J. Dairy Sci. 70(Suppl 1): 177, 1987.

CLAIMS:

1. A method for improving the production of milk from a lactating ruminant animal comprising:

administering to the animal somatotropin in an amount sufficient to increase production of milk; and

generally coextensive in time within said administration, supplementing the food supply for the animal with a long chain fatty acid or long chain fatty acid salt selected to be substantially inert with respect to the rumination of the animal; said administration and said supplementation each being in amounts sufficient to effect the improvement in production.

15. A method of improving conversion of dietary foodstuffs into milk in a lactating ruminant animal comprising;

administering to the animal an amount of somatotropin from about 5 to about 75 milligrams per day; and coadministering to the animal a dietary supplement comprising a nutritionally acceptable alkaline earth salt of a long chain fatty acid, said salt being provided in an amount sufficient to effect said improvement of conversion of dietary foodstuffs into milk.

L2: Entry 23 of 35 File: USPT Oct 14, 1997

DOCUMENT-IDENTIFIER: US 5676966 A
TITLE: Feed additive composition for ruminants

Abstract Text (1):
A granular additive composition for ruminant feed which stably protects a biologically active substance in the rumen of the ruminant and allows it to be effectively digested and absorbed in the digestive organs after the abomasum.

Brief Summary Text (3):
The present invention relates to an additive composition for ruminant feed. More particularly, the present invention relates to an additive composition for ruminant feed which enables digestion and absorption of a biologically active substance in the ruminant's digestive organs after the abomasum by coating the biologically active substance with a coating composition which is stable in the rumen of the ruminant and which releases the biologically active substance in the digestive organs after the abomasum.

Brief Summary Text (6):
When biologically active substances such as amino acids, vitamins, and the like are orally administered directly to ruminants such as cattle, sheep, and the like, they are degraded by microorganisms in the rumen and, therefore, cannot be effectively utilized. Accordingly, rumen-bypass preparations for the ruminant, which protect biologically active substances from degradation by microorganisms in the rumen and allow the biologically active substance to be digested and absorbed in the digestive organs after the abomasum are important in the fields of ruminant feed, nutrient agents, animal drugs, and the like.

Brief Summary Text (7):
An additive composition for ruminant feed containing biologically active substance, coated with a fatty acid having 12 or more carbon atoms, a hardened animal/plant oil, and the like has already been proposed. Although granules coated with such oil and fat provide good protection in the rumen, it is difficult to obtain release of the biologically active substance in the digestive organs after the abomasum.

Brief Summary Text (11):
However, and in view of the importance of the protecting property, the method of dispersing a biologically active substance in a protecting substance requires one to considerably lower the inclusion ratio of the biologically active substance, since the biologically active substance exists near the surface of the granule. Thus, taking into consideration that the residence period in the rumen is from several (10) hours to several days, it is difficult to sufficiently protect water-soluble biologically active substances. On the other hand, when coated with a protecting substance composed of lecithin, glycerol fatty acid ester, and oil and fat, the strength of the coating layer is insufficient and there is a problem in the protecting property. Although the lecithin and glycerol fatty acid ester are used with the expectation of utilizing the emulsifying function of oil and fat, the releasability is not sufficient taking into consideration the time required to pass through the digestive organs after the abomasum.

Brief Summary Text (12):

Finally, a method of coating using a pH-responding synthetic polymer to utilize the difference of pH between the rumen and the abomasum has also been proposed. However, such a method is not satisfactory in view of the organic solvent used for coating, the expensive coating agent, and the like. As described above, for oral administration to the ruminant, it is important to design the preparation so as to prevent release of the biologically active substance in the rumen and release the biologically active substance in the digestive organs after the abomasum.

Brief Summary Text (14):
One object of the present invention is to stably protect a biologically active substance in the rumen of the ruminant and allow it to be effectively digested and absorbed in the digestive organs after the abomasum with considerations of safety and economics in mind.

Brief Summary Text (16):
The inventors of the present invention have discovered that excellent protecting properties in the rumen of a ruminant and extremely good releasability in the digestive organs after the abomasum can be simultaneously achieved by feed or feed additive granules obtained by coating a core comprising a biologically active substance with a coating composition comprising a protecting substance selected from hardened plant oil and fat, hardened animal oil and fat, etc.; an appropriate amount of a surface active agent selected from the group consisting of lecithin and a higher unsaturated fatty acid; and a talc powder. The present invention was completed based on this finding.

Brief Summary Text (17):
Thus, the present invention relates to a preferably granular additive composition for ruminant feed, which comprises a core comprising a biologically active substance and a coating composition coated thereon, said coating composition comprising 65 to 90% by weight of (A), 2 to 10% by weight of the following (B), and 8 to 30% by weight of (C) wherein:

Brief Summary Text (29):
Surface active agents which may be used in the present invention include, lecithins, higher (C.sub.6 -C.sub.30) fatty acids, and oil-soluble non-ionic surface active agents. As the lecithin, soybean lecithin and other lecithins of plant origin, and egg yolk lecithin may be used. As the higher fatty acid, straight or branched saturated or unsaturated fatty acids having 8 or more carbon atoms are preferred. Examples of such fatty acids are behenic, stearic, oleic, palmitic, myristic, lauric, n-caproic and n-caprylic acids. More preferably, higher unsaturated fatty acids such as oleic acid, linoleic acid, palmitleic acid, and the like may be used. As the oil-soluble non-ionic surface active agent, fatty acid diglycerides, and the like are exemplified.

Brief Summary Text (34):
According to the present invention, it is possible to obtain the coating composition by merely mixing the hydrophobic protecting substance, the surface active agent, and the talc powder together. However, a more preferable coating composition may be obtained by treating the surface of the talc powder with the surface active agent in advance so as to improve the dispersion of the talc powder in the coating composition. The method for surface treatment is not particularly limited and examples of the method include a method in which the talc powder and the surface active agent are kneaded in advance and then mixed with the hydrophobic protecting substance; and a method in which the surface active agent is dispersed or dissolved in water or in a organic solvent, the talc powder is added, and then water or the organic solvent is removed.

Brief Summary Text (36):
The granular additive composition for ruminant feed according to the present invention is characterized in that the core containing the above-described

biologically active substance is coated with the above-described coating composition. It is preferable that the coating amount of the coating composition is as low as possible since the inclusion ratio of the biologically active substance becomes high. However, the amount of the coating composition should be such an amount as to sufficiently protect the biologically active substance in the rumen. In general, 100 parts by weight of the core containing the biologically active substance is coated with preferably 10 to 100 parts by weight of the coating composition, more preferably with 20 to 50 parts by weight of the coating composition but including all values and ranges therebetween. The thickness of the coating layer is generally in the range of from 50 .mu.m to 200 .mu.m.

Brief Summary Text (38):
The shape of the granular additive composition for ruminant feed according to the present invention is not particularly limited but those having a diameter of 5 mm or less are preferably used in order to reduce the destruction of the granules due to the rumination of the animal. More preferably, those having a mean granular diameter of 3 mm or less are used. In addition, those having a granular diameter of 1 mm or more are preferably used in order to provide a good ratio of the core to the whole composition. Granules having a specific gravity of 1.0 to 1.5 are preferably used and those having a specific gravity of 1.1 to 1.4 are particularly preferable since the residence period in the rumen of the ruminant is shorter.

Detailed Description Text (12):
A protecting substance containing 5 parts by weight of soybean lecithin, 10 parts by weight of a talc powder and 85 parts by weight of hardened beef tallow was melted, and the melted protecting substance in a proportion of 43 parts by weight was coated on 100 parts by weight of the core sieved with a sieve so as to have a mean granular diameter of 1.5 mm. The coated granules were subjected to the above-described evaluation test. As a result, the rumen released ratio was 3% and the digestive organ-corresponding released ratio was 78%.

Detailed Description Text (16):
Three parts by weight of pork tallow, 5 parts by weight of soybean lecithin, 8 parts by weight of a talc powder having a mean granular diameter of 15 pm, and 2 parts by weight of calcium carbonate were added to 82 parts by weight of hardened beef tallow, and the resulting mixed and melted coating composition in a proportion of 43 parts by weight was coated on 100 parts by weight of the core prepared in the same manner as Example 1 and sieved with a sieve so as to have a mean granular diameter of 2.00 mm. The coated granules were subjected to the above-described evaluation test. As a result, the rumen released ratio was 4% and the digestive organ-corresponding released ratio was 83%.

Detailed Description Text (20):
A methionine-containing core was obtained in the same manner as Example 1 by using 325 g of methionine, 172.5 g of talc, 2.5 g of caroboxymethylcellulose sodium, and 100 g of water. Five parts by weight of lecithin and 15 parts by weight of a talc powder were added to 80 parts by weight of hardened beef tallow, and the resulting mixed and melted coating composition in a proportion of 43 parts by weight was coated on 100 parts by weight of the core prepared in the same manner as Example 1 and sieved with a sieve so as to have a mean granular diameter of 1.70 mm. The coated granules were subjected to the above-described evaluation test. As a result, the rumen released ratio was 3% and the digestive organ-corresponding released ratio was 81%.

Detailed Description Text (26):
A coating composition obtained by adding and mixing 5 parts by weight of soybean lecithin to 95 parts by weight of hardened beef tallow was melted, and the melted coating composition in a proportion of 39 parts by weight was coated on 100 parts by weight of the core prepared in Example 2. The coated granules were subjected to the above-described evaluation test. As a result, the rumen released ratio was 8%

and the digestive organ-corresponding released ratio was 21%.

Detailed Description Text (28):
A coating composition obtained by adding and mixing 8 parts by weight of soybean lecithin to 92 parts by weight of hardened beef tallow was melted, and the melted coating composition in a proportion of 33 parts by weight was coated on 100 parts by weight of the core prepared in Example 1. The coated granules were subjected to the above-described evaluation test. As a result, the rumen released ratio was 25% and the digestive organ-corresponding released ratio was 35%.

Detailed Description Text (34):
As explained above, a granular additive composition for ruminant feed which has effects in its protecting property in the rumen and releasability in the digestive organs after the abomasum in comparison with the prior art is obtained by a preparing a granular composition which comprises a core comprising a biologically active substance and a coating composition comprising 90 to 65% by weight of at least one hydrophobic protecting substance selected from the group consisting of hardened animal and plant oils and fats, animal and plant fats, and fatty acid esters, 2 to 10% by weight of the surface active agent compatible with the hydrophobic protecting substance, and 8 to 30% by weight of a talc powder.

Detailed Description Text (35):
The present invention provides a feed additive by which the biologically active substance can be effectively absorbed by the ruminant. This application is based on Japanese Application 081500/1994 filed Apr. 20, 1994 incorporated herein by reference.

Detailed Description Paragraph Table (3):
TABLE 1 Example No. 1 2 3 4 5 6
Biologically Lysine Lysine Lysine Lysine Methio- Lysine Active hydro- hydro- hydro- hydro- nine hydro- Substance chloride chloride chloride chloride chloride Mean Granular 1.5 1.18 2.00 2.36 1.70 1.5 Diameter (mm) Weight Part 100 100 100 100 100 100 of Core Weight Part of 43 39 43 43 43 43 Coating Layer Composition (%) Beef Tallow 85 77 82 85 80 85 Hardened Oil Pork Tallow -- -- 3 -- -- -- Lecithin 5 -- 5 -- 5 5 Oleic Acid -- 3 -- 3 -- -- Talc Powder 10 20 10 15 10 Gum Arabic -- -- -- 2 -- -- Calcium -- -- 2 -- -- -- Carbonate High not not not not not carried Temperature carried carried carried carried carried out Treatment out out out out out (40.degree. C., 96 Hrs) Released Ratio (%) Corresponding 3 5 4 5 3 7 to Rumen Corresponding 78 82 83 80 81 79 to Digestive Organ (Abomasum and Small Intestine)

Detailed Description Paragraph Table (4):
TABLE 2 Comparative Example No. 1 2 3 4 5
Biologically Active Lysine Lysine Lysine Lysine Lysine Substance hydro- hydro- hydro- hydro- hydro- chloride chloride chloride chloride chloride chloride Mean Granular Diameter 1.5 1.18 1.5 1.18 1.5 (mm) Weight Part of Core 100 100 100 100 100 Weight Part of Coating 39 39 33 39 33 Layer Composition (%) Beef Tallow 80 95 92 77 92 Hardened Oil Lecithin -- 5 8 -- 8 Oleic Acid -- -- -- 3 -- Talc Powder 20 -- -- 20 -- High Temperature not not not not carried Treatment carried carried carried carried out (40.degree. C., 96 Hrs) out out out out Released Ratio (%) Corresponding to 1 8 25 55 67 Rumen Corresponding to 1 21 35 42 27 Digestive Organ (Abomasum and Small Intestine)

CLAIMS:

1. A composition for ruminant feed, comprising a core and a coating composition coated thereon, said core comprising a biologically active substance, said coating composition comprising 65 to 90% by weight of (A), 2 to 10% by weight (B), and 8 to

30% by weight (C), wherein (A) is at least one hydrophobic protecting substance selected from the group consisting of hardened animal and plant oil and fat, animal and plant fat, and a fatty acid ester, (B) is a surface active agent compatible with said hydrophobic protecting substance (A), and (C) is talc powder, wherein said talc is in the form of a fine powder having a mean granular diameter of 40 .mu.m or less.

2. The composition as claimed in claim 1, wherein said surface active agent compatible with the hydrophobic protecting substance is at least one member selected from the group consisting of lecithin and C.sub.6 -C.sub.30 unsaturated fatty acids.